Claims

1. A testing method, comprising:

writing two concentric tracks on a noise free portion of a magnetic storage medium;

positioning a magnetic read/write head and a micro-actuator between the two concentric tracks;

applying a first oscillating voltage at a first frequency to the micro-actuator while reading back a first signal from the two concentric tracks; and

calculating a first stroke characteristic of the micro-actuator based in part on the first signal.

2. The testing method of claim 1, wherein the noise free portion of the data storage medium is created by erasing a portion of the data storage medium.

3. The testing method of claim 1, further comprising determining the first oscillating voltage from previous tests.

4. The testing method of claim 1, wherein the first stroke characteristic of the micro-actuator is based on a time-averaged amplitude of the first signal.

5. The testing method of claim 4, further comprising writing the two concentric tracks at a pre-determined pitch.

6. The testing method of claim 5, further comprising generating a calibration curve based on a relation between the pitch (2δ), the time-averaged amplitude (TAA), a track radius (r), and the first stroke characteristic (S) represented by:

$$TAA(i) = \frac{2}{\pi} \int_{-\delta}^{\delta - \delta} \frac{TAA(r)}{\sqrt{[S(i)]^2 - (r+\delta)^2}} \bullet dr .$$

7. The testing method of claim 1, further comprising:

applying a second oscillating voltage at a second frequency to the micro-actuator while reading back a second signal from the two concentric tracks; and

calculating a second stroke characteristic of the micro-actuator based in part on the second signal.

8. The testing method of claim 7, further comprising calculating the second voltage by multiplying the first voltage by the first stroke characteristic divided by an ideal stroke characteristic.

9. The testing method of claim 8, further comprising using a typical frequency response to predict a gain change between the first frequency and the second frequency.

10. A testing system, comprising:

a magnetic storage medium to store data;

a magnetic read/write head to write two concentric tracks on a noise free portion of the magnetic storage medium;

a head gimbal assembly to position the magnetic read/write head and a micro-actuator between the two concentric tracks; and

a tester to apply a first oscillating voltage at a first frequency to the micro-actuator while reading back a first signal from the two concentric tracks.

11. The testing system of claim 10, wherein a first stroke characteristic of the micro-actuator is based on a time-averaged amplitude of the first signal.

12. The testing system of claim 11, wherein the tester applies a second oscillating voltage at a second frequency to the micro-actuator while reading back a second signal from the two concentric tracks.

13. The testing system of claim 12, wherein the second oscillating voltage is calculated by multiplying the first oscillating voltage by the first stroke characteristic divided by an ideal stroke characteristic.

14. The testing system of claim 12, wherein a typical frequency response is used to predict a gain change between the first frequency and the second frequency.

15. A set of instructions residing in a storage medium, said set of instructions capable of being executed by a processor to implement a method for processing data, the method comprising:

writing two concentric tracks on a noise free portion of a magnetic storage medium;

positioning a magnetic read/write head and a micro-actuator between the two concentric tracks;

applying a first oscillating voltage at a first frequency to the micro-actuator while reading back a first signal from the two concentric tracks; and

calculating a first stroke characteristic of the micro-actuator based in part on the first signal.

16. The set of instructions of claim 15, further comprising determining the first oscillating voltage from previous tests.

17. The set of instructions of claim 15, wherein the first stroke characteristic of the micro-actuator is based on a time-averaged amplitude of the first signal.

18. The set of instructions of claim 17, further comprising writing the two concentric tracks at a pre-determined pitch.

19. The set of instructions of claim 18, further comprising generating a calibration curve based on a relation between the pitch (2δ), the time-averaged amplitude (TAA), a track radius (r), and the first stroke characteristic (S) represented by:

$$TAA(i) = \frac{2}{\pi} \int_{-\delta}^{\delta-\delta} \frac{TAA(r)}{\sqrt{[S(i)]^2 - (r+\delta)^2}} \bullet dr .$$

20. The set of instructions of claim 15, further comprising:

applying a second oscillating voltage at a second frequency to the micro-actuator while reading back a second signal from the two concentric tracks; and

calculating a second stroke characteristic of the micro-actuator based in part on the second signal.

21. The set of instructions of claim 20, further comprising calculating the second voltage by multiplying the first voltage by the first stroke characteristic divided by an ideal stroke characteristic.

22. The set of instructions of claim 20, further comprising using a typical frequency response to predict a gain change between the first frequency and the second frequency.